

WHAT IS CLAIMED IS:

1. A method for forming a contact for a semiconductor device, comprising:
depositing a polysilicon material over the semiconductor device;
oxidizing at least a portion of the polysilicon material to form an oxide;
etching at least one of the oxide and the polysilicon material to form a contact hole; and
filling the contact hole to form the contact for the semiconductor device.
2. The method of claim 1, further comprising:
forming an interlayer dielectric over the semiconductor device; and
wherein the depositing a polysilicon material includes:
depositing the polysilicon material over the interlayer dielectric.
3. The method of claim 2, wherein the etching at least one of the oxide and the polysilicon material includes:
etching the polysilicon material using the oxide as a mask, the etching of the polysilicon material removing at least some of the oxide.
4. The method of claim 3, wherein the etching at least one of the oxide and the polysilicon material further includes:
etching the interlayer dielectric using the polysilicon material as a mask to form the contact hole, the contact hole extending through the interlayer dielectric.
5. The method of claim 1, further comprising:
forming an antireflective coating on the polysilicon material;

forming and patterning a photoresist on the antireflective coating; and
etching the antireflective coating not located under the photoresist.

6. The method of claim 5, further comprising:

stripping the photoresist prior to oxidizing the polysilicon material.

7. The method of claim 1, wherein the filling the contact hole includes:

forming a barrier layer on surfaces of the contact hole, and

depositing tungsten to at least partially fill the contact hole.

8. The method of claim 1, further comprising:

polishing the semiconductor device to remove the polysilicon material after etching the at least one of the oxide and the polysilicon material.

9. A method for forming a contact for a semiconductor device, comprising:

forming an interlayer dielectric on the semiconductor device;

depositing a nitride layer over the interlayer dielectric;

polishing the nitride layer to expose a portion of the interlayer dielectric;

forming a contact hole through the exposed portion of the interlayer dielectric; and

filling the contact hole to form the contact for the semiconductor device.

10. The method of claim 9, further comprising:

etching a portion of the interlayer dielectric to form a protrusion; and

wherein the depositing a nitride layer includes:

depositing the nitride layer to cover the protrusion.

11. The method of claim 10, wherein the polishing the nitride layer includes:

exposing at least a portion of the protrusion.

12. The method of claim 11, wherein the forming a contact hole through the exposed portion of the interlayer dielectric includes:

etching the protrusion and continuing the etching through the interlayer dielectric to form the contact hole.

13. The method of claim 10, further comprising:

forming an antireflective coating on the interlayer dielectric; and

forming and patterning a photoresist on the antireflective coating; and

wherein the etching a portion of the interlayer dielectric includes:

etching the antireflective coating and the interlayer dielectric to form the protrusion located below the photoresist.

14. The method of claim 9, wherein the filling the contact hole includes:

forming a barrier layer on surfaces of the contact hole, and

depositing tungsten to at least partially fill the contact hole.

15. The method of claim 9, further comprising:
polishing the semiconductor device to remove the nitride layer after polishing the nitride layer.
16. A method for forming a contact for a semiconductor device, comprising:
depositing a first polysilicon material over the semiconductor device;
depositing an oxide material on the first polysilicon material;
etching the oxide material to leave a portion of the oxide material;
removing the portion of the oxide material;
forming a contact hole through the first polysilicon material at a location of the removed portion of the oxide material; and
filling the contact hole to form the contact for the semiconductor device.
17. The method of claim 16, further comprising:
forming an interlayer dielectric over the semiconductor device; and
wherein the depositing a first polysilicon material includes:
depositing the first polysilicon material over the interlayer dielectric.
18. The method of claim 17, further comprising:
forming a second polysilicon material adjacent the portion of oxide material; and
wherein the forming a contact hole includes:
etching the interlayer dielectric using the first and second polysilicon materials as a mask to form the contact hole that extends through the interlayer dielectric.

19. The method of claim 16, further comprising:
selectively depositing second polysilicon material on the first polysilicon material adjacent the portion of the oxide material and prior to removing the portion of the oxide material.
20. The method of claim 16, wherein the etching the oxide material includes:
forming an antireflective coating on the oxide material;
forming and patterning a photoresist on the antireflective coating; and
etching the oxide material and the antireflective coating not located below the photoresist.
21. The method of claim 20, further comprising:
stripping the photoresist after etching the oxide material.
22. The method of claim 16, wherein the filling the contact hole includes:
forming a barrier layer on surfaces of the contact hole, and
depositing a conductive material to at least partially fill the contact hole.
23. The method of claim 16, further comprising:
polishing the semiconductor device to remove the polysilicon material after forming the contact hole.
24. A method for forming a contact for a semiconductor device, comprising:
depositing a carbon material over the semiconductor device;

etching the carbon material to leave a portion of the carbon material;
depositing a nitride material;
forming a contact hole by removing the portion of the carbon material; and
filling the contact hole to form the contact for the semiconductor device.

25. The method of claim 24, further comprising:
forming an interlayer dielectric over the semiconductor device; and
wherein the depositing a carbon material includes:
depositing the carbon material over the interlayer dielectric.

26. The method of claim 25, wherein the forming a contact hole further includes:
etching the interlayer dielectric using the nitride material as a mask to form the contact
hole that extends through the interlayer dielectric.

27. The method of claim 24, further comprising:
forming an antireflective coating on the carbon material; and
forming and patterning a photoresist on the antireflective coating; and
wherein the etching the carbon material includes:
etching the carbon material and the antireflective coating based on the photoresist.

28. The method of claim 27, further comprising:
stripping the photoresist after etching the carbon material and the antireflective coating.

29. The method of claim 24, wherein the filling the contact hole includes:
forming a barrier layer on side surfaces of the contact hole, and
depositing a conductive material to at least partially fill the contact hole.

30. The method of claim 24, further comprising:
polishing the semiconductor device to remove the nitride material after forming the
contact hole.